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## (54) METHOD OF REUSING SUBSTRATE FOR IMAGE PRESENTATION

(71) We, SHADE INCORPORATED, a Corporation organised and existing under the laws of the State of Wisconsin, United States of America, of Post Office Box No. 730, Green Bay, Wisconsin, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a process for the multiple use of sheet substrates and has an important application in the reuse of sheets of paper.

It has become increasingly important to reuse and conserve raw materials and natural resources. One raw material (or natural resource) which is being wasted at a tremendous rate is paper employed in office use situations. Frequently, a large number of copies of a memorandum are circulated, studied and then thrown away. Such a wasteful situation is avoided by the instant invention wherein the substrate carrying the informational image can be literally "erased" so as to render the substrate suitable for use again and again.

The only attempt that has been made to conserve a natural resource such as paper, particularly the large number of papers passing over desks for informational purposes which are read and thrown away, is to collect the same for re-working at the paper mill, i.e., recycling.

According to one aspect of the invention there is provided a process for the multiple reuse of a plurality of discrete sheets of paper stock having a protective film on the surface thereof on which is created an image copy for the presentation and dissemination of visual information by xerographic reproduction which does not produce condensations in the surface of the paper sheet stock with image copy thereon after dissemination of such visual information from various locations, and subsequently cleaning such paper sheet stock by removing the image copy from the surface

thereof, thereby readying such paper sheet stock for reuse in presenting and disseminating other visual information as before.

The paper sheet stock may be subjected to a solvent to release the image copy therefrom. After the cleaning step another image copy may be created on the surface of the paper sheet stock, and the paper sheet stock redistributed to various locations for the presentation and dissemination of such visual information as before.

According to another aspect of the invention there is provided a process for the multiple reuse of a plurality of discrete sheets having a surface on which is created an image copy for the presentation and dissemination of visual information by xerographic reproduction which does not produce indentations in the surface of the discrete sheets, such surface having release properties for the image copy when contacted with a suitable solvent, comprising the steps of collecting such sheets with image copy thereon after dissemination of such visual information, and subsequently cleaning such sheets by subjecting such sheets to a solvent to release the image copy therefrom, thereby readying such sheets for reuse in presenting and disseminating other visual information as before.

A wide variety of substrates may be employed such as paper or other core material capable of providing the necessary background for the image and wherein the material is coated or otherwise covered by means of a film or layer which has release properties for the informational image when the same is contacted with a suitable solvent.

After reuse the image carrying substrate may be viewed, stored or filed or otherwise made use of until such time as it becomes advantageous to return the substrate to its original unprinted condition. This can be achieved through the use of suitable solvents, as indicated above and the substrate thereupon readied for future use.

The invention is described in conjunction

with the accompanying drawing, in which:—

Figure 1 is a schematic representation of the process of the invention; and

Figure 2 is a cross-sectional view of a substrate used therein.

In the drawing, the numeral 10 designates generally a substrate which may take a variety of forms although advantageously it may take the form seen in Figure 2 wherein the numeral 11 designates a paper or other core material laminated between outer film coatings 12 and 13 which, in one form or the invention may be "Mylar" (Registered Trade Mark), an ethylene terephthalate marketed by E. I. DuPont de Nemours & Co. Normally, the paper is 0.02-0.003" in thickness and has surface dimensions corresponding to the intended usage, viz., 8-1/2" by 11", 8-1/2" by 13", etc. The film covering 12 or 13 may be of the order of a fraction of a mil, i.e., 0.002-0.0001". The films 12 and 13 may be coupled to the core 11 through a variety of procedures such as adhesion, extrusion, or the like.

Such a substrate is then delivered for image reception to a suitable device schematically represented by the block 14 which carries the legend "xerographic reproduction". Again, a variety of devices and methods may be employed here including "Xeroxing", according to the procedure of Xerox (Registered Trade Mark) Corporation. The resultant product carrying the image as at 15 with the product being designated 10' is shown in Figure 1 carrying the legend "use". For example, the use may be for an office memorandum where the circulation and life is limited. Instead of relegating the memorandum to the wastebasket, the used memorandum is merely placed in a rack or other convenient receptacle for pickup and delivery to the rejuvenation station 16 for reconstitution. This may take the form of a press or other web contacting device wherein a solvent suitable for removal of the image is employed. With the toner particles characteristic of most xerographic machines employed today, a solvent such as toluene or tetrachloroethylene may be employed. Clearly, the character of the solvent is best ascertained as a function of the image creating media.

WHAT WE CLAIM IS:—

1. A process for the multiple reuse of a plurality of discrete sheets of paper stock having a protective film on the surface thereof on which is created an image copy for the presentation and dissemination of visual information by xerographic reproduction which does not produce indentations in the surface of the paper sheet stock, comprising the steps of collecting such paper sheet stock with image copy thereon after dissemination of such visual information from various locations, and subsequently cleaning such paper sheet stock by removing the image copy from the surface thereof, thereby readying such paper sheet stock for reuse in presenting and disseminating

other visual information as before.

2. A process as claimed in Claim 1, wherein during the cleaning step, the paper sheet stock is subjected to a solvent to release the image copy therefrom.

3. A process as claimed in Claim 1 or Claim 2, wherein after the cleaning step another image copy is created on the surface of the paper sheet stock, and the paper sheet stock is redistributed to various locations for the presentation and dissemination of such visual information as before.

4. A process as claimed in any one of the preceding claims, wherein the protective film on the surface of the paper sheet stock is made of a suitable plastic.

5. A process for the multiple reuse of plural unit sheet substrates for the presentation and dissemination of visual information, such unit sheet substrates having a protective surface on which is created an image copy by xerographic reproduction which does not produce indentations in the surface of the unit sheet substrates, such protective surface having release properties for the informational image when contacted with a suitable solvent, comprising the steps of collecting such unit sheet substrates after dissemination of such visual information, removing the image copy from the surface of such unit sheet substrates by subjecting such unit sheet substrates to a solvent to release the image copy therefrom and thereby render such unit sheet substrates ready for reuse, creating a second image copy on the surface of such unit sheet substrates, and redistributing such unit sheet substrates with such second image copy thereon to provide additional visual information to readers using the same unit sheet substrates as before.

6. A process for the multiple reuse of a plurality of discrete sheets having a surface on which is created an image copy for the presentation and dissemination of visual information by xerographic reproduction which does not produce indentations in the surface of the discrete sheets, such surface having release properties for the image copy when contacted with a suitable solvent, comprising the steps of collecting such sheets with image copy thereon after dissemination of such visual information, and subsequently cleaning such sheets by subjecting such sheets to a solvent to release the image copy therefrom, thereby readying such sheets for reuse in presenting and disseminating other visual information as before.

7. A process for the reuse of sheet substrates substantially as hereinbefore described with reference to the accompanying drawing.

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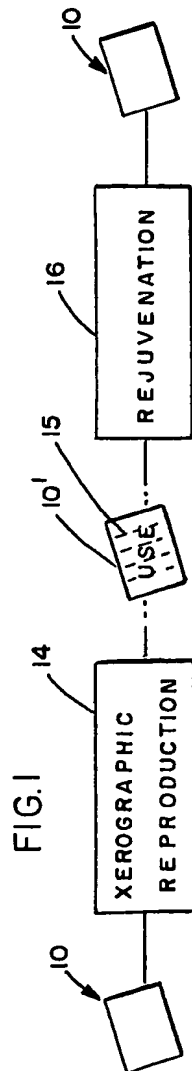


FIG. 2

